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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/674,984	01/08/2001	Volker Becker	10191/1565	9242

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EXAMINER

COLEMAN, WILLIAM D

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 05/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/674,984

Applicant(s)

BECKER ET AL.

Examiner

W. David Coleman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 23-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-47 is/are rejected.
- 7) ☒ Claim(s) 48 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 January 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- |                                                                                                              |                                                                             |
|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5</u> . | 6) <input type="checkbox"/> Other:                                          |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the metallized surface on the surface of the sacrificial layer must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.
2. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 23, 24, 25, 26, 27, 28, 29, 30 and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Blayo et al., U.S. Patent 5,739,909.
5. Pertaining to claim 23, Blayo discloses a semiconductor device as claimed. See **FIGS. 1 & 2**, where Blayo teaches a device for determining an extent of an at least locally undercut of a structured surface layer on a sacrificial layer, comprising:

at least one passive electronic component **40**(column 1, line 14, semiconductor device) arranged on a the structured surface layer and for determining a physical measured quantity that is proportional to the extent of the lateral undercut (column 1, lines 23-34).

6. Pertaining to claim 24, Blayo teaches wherein the physical measured quantity corresponds to one of:

a capacitance,

one of an absorbed intensity and an emitted intensity of an electromagnetic emission,

one of an absorbed frequency and an emitted frequency, and

one of an absorbed frequency spectrum and an emitted frequency spectrum of the electromagnetic emission.

7. Pertaining to claim 25, Blayo teaches wherein the one of the absorbed frequency and the emitted frequency corresponds to a resonance frequency.

8. Pertaining to claim 26, Blayo teaches wherein at least one transmitter **20** for emitting a first signal;

at least one receiver **60** for detecting a second signal, the at least one passive electronic component **40** interacting with the first signal and one of generating the second signal and transforming the first signal into the second signal.

9. Pertaining to claim 27, Blayo teaches wherein the physical measured quantity is determined from one of:

the second signal, and

a difference between the first signal and the second signal and the second signal.

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10. Pertaining to claim 28, Blayo, teaches wherein the at least one transmitter and the at least one receiver are integrated in an assembly.
11. Pertaining to claim 29, Blayo teaches wherein the assembly includes a processing unit.
12. Pertaining to claim 30, Blayo teaches wherein the at least one transmitter is at the same time also the at least one receiver.
13. Pertaining to claim 37, Blayo teaches wherein the structured surface layer, at least in an area of the at least one passive electronic component, is separated from a base layer by the sacrificial layer.

*Claim Rejections - 35 USC § 103*

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 33, 35, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blayo et al., U.S. Patent 5,739,909 as applied to claims 23-30 and 37 above, and further in view of Abidi et al., U.S. Patent 5,539,241.
16. Blayo discloses a semiconductor device substantially as claimed as discussed above, however, Blayo fails to teach the following limitations.

Pertaining to claims 33, 35 and 37, Blayo fails to teach wherein the at least passive electronic component includes a coil delineated out in the structure surface layer and including a first coil end and a second coil end, the coil and a base layer arranged with respect to the structured surface layer and the sacrificial layer form a capacitor having a capacitance

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proportional to the extent of the lateral undercut. Abidi teaches a passive electron component which includes a coil delineated out in the structure surface layer and including a first coil end and a second coil end, the coil and a base layer arranged with respect to the structured surface layer and the sacrificial layer form a capacitor having a capacitance proportional to the extent of the lateral undercut. See **FIGS. 2** and **4a**, where Abidi teaches an inductor having a built in capacitor (parasitic capacitor). In view of Abidi, it would have been obvious to one of ordinary skill in the art to incorporate the passive component of Abidi into the Blayo semiconductor device because there are numerous advantages to integrating not only the transistor but also the inductors and other passive components because manufacturing cost and power consumption can be substantially reduced (column 1, lines 13-17). Please note that the passive electronic component is separated from a base layer by the sacrificial layer.

17. Pertaining to claims 36, Blayo fails to teach wherein at least one of the first coil end is dimensioned in an extent thereof such that a complete undercut of the at least one of the first coil end and the second coil end does not occur. Abidi teaches wherein at least one of the first coil end is dimensioned in an extent thereof such that a complete undercut of the at least one of the first coil end and the second coil end does not occur. See **FIG. 2** of Abidi where the coil ends are not undercut. In view of Abidi, it would have been obvious to one of ordinary skill in the art to not undercut the coil ends in the Blayo semiconductor device because the motivation is to provide a stable platform for the coil ends.

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18. Claims 38, 39, 40, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blayo et al., U.S. Patent 5,739,909 in view of Abidi et al., U.S. Patent 5,539,241 as applied to claims 23-30, 33, 35, 36 and 37 above, and further in view of Curran, U.S. Patent 5,126,284.

19. Pertaining to claims 38 and 39, the combined teachings of Blayo and Abidi fail to disclose a semiconductor device wherein a structure of the base layer corresponds to one of:

a material including silicon and polysilicon, and a silicon wafer. Curran teaches providing a material of silicon and a silicon wafer. See **FIG. 1** of Curran, wherein an inductor composed of silicon and a silicon wafer is disclosed. In view of Curran, it would have been obvious to one of ordinary skill in the art to incorporate silicon into the combined teachings of Blayo and Abidi because silicon is highly useful in silicon-based solid-state electronic devices (column 7, lines 36-37).

20. Pertaining to claims 40, 41 and 42 the combined teachings of Blayo and Abidi fail to teach a silicon oxide layer and a structured surface layer including trenches that extend in depth down to the sacrificial layer wherein the trenches border a structure to be under cut, in the structured surface area. Curran teaches a silicon oxide layer and a structured surface layer including trenches that extend in depth down to the sacrificial layer wherein the trenches border a structure to be under cut. In view of Curran, it would have been obvious to one of ordinary skill in the art to teach a silicon oxide layer and a structured surface layer including trenches that extend in depth down to the sacrificial layer wherein the trenches border a structure to be under cut in the combined teachings of Blayo and Abidi because the motivation would be to make passive electronic devices that are three dimensional and functional.

21. Claims 43-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nasserbakht, U.S. Patent 6,143,614 in view of Blayo et al., U.S. Patent 5,739,909.
22. Pertaining to claim 43, Nasserbakht discloses a semiconductor process substantially as claimed. See **FIGS. 1 and 3** where Nasserbakht teaches a method for determining an extent of a lateral undercut of a structure surface layer on a sacrificial layer, comprising the steps of:
- performing a first etching operation (etching the oxide layer **34**) to provide at least locally to the structured surface layer a structure including trenches, wherein the first etching operation includes the step of:
    - locally additionally delineating at least one passive electronic component out of the structured surface layer;
    - performing a second etching operation (etching the inductor layer 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 and 32) that begins from the trenches and generates at least locally the lateral undercut of the structured surface layer;
    - undercutting the at least one passive electronic component in response to the undercutting of the structured surface layer; and
    - in response to the undercutting of at least one of the structured surface layer and the at least one passive electronic component. However, Nasserbakht fails to determine a physical measured quantity proportional to the extent of the lateral undercut. Blayo teaches a process to determine a measured quantity proportional to the extent of the lateral undercut. In view of Blayo, it would have been obvious to one of ordinary skill in the art to incorporate the physical measured quantity proportional to the extent of the lateral undercut in the Nasserbakht



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semiconductor process because the measurement and control requires tighter design rules on devices which are less than one micron in width (column 1, lines 1-19).

23. Pertaining to claim 44, Nasserbakht teaches wherein the step of performing the first etching operation through a masking.

24. Pertaining to claim 45, Nasserbakht teaches further comprising the step of: applying the sacrificial layer **34** on a base layer **38**.

25. Pertaining to claim 46, Nasserbakht teaches wherein the step of delineating occurs through an etching of the trenches.

26. Pertaining to claim 47, Nasserbakht teaches further comprising the step of: delineating a coil out of the structured surface layer as the at least one passive electronic component.

#### *Objections*

27. Claim 48 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### *Claim Rejections - 35 USC § 112*

28. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

29. Claim 23 recites the limitation "the lateral undercut" in last line of the sentence. There is insufficient antecedent basis for this limitation in the claim.

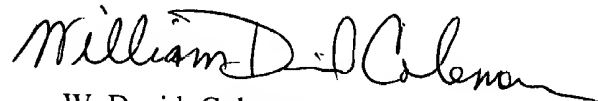
30. Claims 31, 32, and 34 are rejected to due to the 35 U.S.C. 112 second paragraph rejection of the preceding claims, which would have otherwise been objectionable.

*Conclusion*

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. David Coleman whose telephone number is 703-305-0004. The examiner can normally be reached on 9:00 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



W. David Coleman  
Examiner  
Art Unit 2823

WDC  
May 21, 2002